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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/772,418

02/06/2004

Burton H. Sage JR.

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2059

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10/11/2006

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WASHINGTON, DC 20007

EXAMINER

ALSOMIRI, ISAM A

ART UNIT

PAPER NUMBER

3662

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/772,418	<b>Applicant(s)</b> SAGE ET AL.	
	<b>Examiner</b> Isam Alsomiri	<b>Art Unit</b> 3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 22-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2006 is/are: a) ☒ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                    |                                                                             |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____                                                |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>080406</u> .                                                              | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 22-28, 30-38, 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al. US6386050B1 in view of Crosswy et al US 3552855.**

Referring to claims 22 and 33, Yin discloses in figure 1 a liquid metering device comprising: a conduit (10 12) adapted to permit liquid to flow through the conduit, a portion of the conduit having a wall (44) through which light may pass; a liquid heater (20,22) adapted to heat a portion of the liquid at a first position along the conduit; a light source adapted to generate at least one beam; a beam splitter (wall of the conduit) adapted to split the at least one beam into a first beam and a second beam directed along respective first and second beams paths, wherein (i) the first beam path passes, with respect to a first side of the conduit, all the way through the conduit and all the way through the lumen at a second position along the conduit and the second beam path does not pass through the lumen of the conduit (see figure 1, the first light passes the lumen bounces back at the other wall and exits the conduit at a second position);

Yin does not teach a device adapted to combine the first and second beams after the first beam at least one of passed all the way through the lumen and crossed the lumen such that the first and second beams undergo a degree of interference. Crosswy

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teaches a similar system including the device adapted to combine the first and second beams (22 and 23) after the first beam has crossed the lumen (see figures 2 and 3). It would have been obvious to include the combiner to detect the signals simultaneously and accurately. The combination of Yin and Crosswy teaches the optical detector (28) adapted to detect an intensity variation of the combined first and second beams caused by a heated portion of the liquid passing through the first beam (see Yin; abstract, col. 6 line 63 – col. 7 line 8).

Referring to claims 25 and 34, it's inherent that the wall the wall is a glass wall or a polymer wall since the conduit is a transparent capillary tube (see col. 5 lines 49-64). However, even if it is not inherent, it would have been very well known and obvious to modify Yin's system to use a glass capillary tube that can be transparent to light so light can pass through the liquid.

Referring to claims 26 and 35, Yin teaches the liquid metering system of wherein the portion of the conduit has a lumen with a rectangular or square cross section (see col. 6 lines 14-20).

Referring to claims 30-31 and 42-43, Yin teaches a processor 18 adapted to determine the speed at which the liquid is passing through the conduit based on the time between the point at which fluid begins to flow through the conduit and the time that the optical detector detects an intensity variation of the combined first and second beams (see col. 6 line 63 – col. 7 line 8).

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Referring to claims 32 and 41, Yin teaches the detector detects a change in the degree of interference caused by the heated portion of the liquid passing through the first beam (see col. 6 line 63 – col. 7 line 8).

Referring to claims 27 and 37, Yin teaches the liquid heater is an infrared laser (see col. 3 lines 8-16).

Referring to claims 28 and 36, Yin teaches the light used is visible light (see col. 6 lines 51-55 “below 1100 nm”). However, even if it is not visible, using visible light is well known and It would have not been obvious to use a mere alternative way.

Referring to claim 23-24, 38 and 40, Yin does not teach the optical phase delay element in the first path or the second path. Crosswy teaches using a focusing lens (31 and 36) in the path of the first and second paths, and the lens are inherently a phase delay element (see figures 2-3). It would have been obvious to modify Yin to include the focusing lens for better and accurate beam focus on the conduit.

**Claims 29 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yin et al. US6386050B1 in view of Crosswy et al US 3552855 and Johnson US 3,511,227.**

Yin does not teach the light source is coherent. Johnson teaches using coherent light. It would have not been obvious to modify Yin's system to use coherent light for accurate light variation detections of the first and second beams.

***Response to Arguments***

Applicant's arguments filed July 12, 2006 have been fully considered but they are not persuasive. With respect to claims 22 and 33, applicant argues that "In Yin, there is no first beam path that passes, with respect to the beam splitter, all the way through the conduit and through the lumen, and a second beam path that does not pass through the lumen of the conduit, along with a device that combines these first and second beams after the first beam has passed all the way through the lumen, such that the first and second beams undergo a degree of interference, and along with a detector that detects an intensity variation of the combined first and second beams". As mentioned in the office action above, the combination of Yin and Crossway teaches the beam splitter shown in figure 1, the light beam is split into two beams, the first goes through the lumen the second is directed away from the lumen, the first beam as can be seen from the figure pass all the way through the lumen twice and back all the way through the conduit at a second position; while the second beam does not cross the lumen. Therefore, it reads on the broad claim language of part (i) in claims 22 and 23. Regarding claims 25 and 34, applicant is challenging the inherency regarding the wall being glass or polymer. However, because Yin teaches that the conduit being a capillary tube, which is also transparent; it is a must that the capillary tube is made of glass or a polymer. Regarding claims 26 and 35, Yin does teach a capillary tube with rectangular cross section (see col. 6 lines 14-17).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isam Alsomiri whose telephone number is 571-272-6970. The examiner can normally be reached on Monday-Friday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

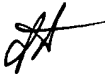
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Isam Alsomiri



September 28, 2006



THOMAS H. TARCZA  
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